

CLAIMS

1 A system for copy protection of an information carrier, said system comprising:

- 5 - a diffractive layer for delivering a speckle pattern when illuminated by a light source,
- a spatial filter, which is aligned with respect to the diffractive layer, for delivering a filtered optical signal from the speckle pattern,
- a detector array for delivering, when illuminated by said filtered optical signal, an electrical signal,
- 10 - means for computing a cryptographic key from the electrical signal, and
- means for decrypting encrypted data contained in the information carrier from the cryptographic key.

2 An information carrier for use in the system of Claim 1, said carrier comprising:

- 15 - a diffractive layer for delivering a speckle pattern when illuminated by a light source,
- a spatial filtering layer which is aligned with respect to the diffractive layer, for delivering a filtered optical signal from the speckle pattern,
- a detection layer for delivering, when illuminated by said filtered optical signal, an electrical signal, from which a cryptographic key can be generated.

3 A device for reading an information carrier as claimed in Claim 2, said device comprising:

- 25 - means for computing a cryptographic key from the electrical signal delivered by the information layer, and
- means for decrypting encrypted data contained in the information carrier from the cryptographic key.

4 An information carrier for use in the system of Claim 1, said carrier comprising:

- a diffractive layer for delivering a speckle pattern when illuminated by a light source,
- a spatial filtering layer which is aligned with respect to the diffractive layer, for delivering a filtered optical signal from the speckle pattern.

5 A device for reading an information carrier as claimed in Claim 4, said device comprising:

- a detector array for delivering, when illuminated by the filtered optical signal, an electrical signal, from which a cryptographic key can be generated,
- 5 - means for computing a cryptographic key from the electrical signal delivered by the information layer, and
- means for decrypting encrypted data contained in the information carrier from the cryptographic key.

10 6 A device for reading an information carrier comprising a diffractive layer for delivering a speckle pattern when illuminated by a light source, said device comprising:

- a spatial filter which is aligned with respect to the diffractive layer, for delivering a filtered optical signal from the speckle pattern,
- a detector array for delivering, when illuminated by said filtered optical signal, an electrical signal, from which a cryptographic key can be generated,
- 15 - means for computing a cryptographic key from the electrical signal delivered by the information layer, and
- means for decrypting encrypted data contained in the information carrier from the cryptographic key.

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7 A device for reading an information carrier as claimed in Claim 6, wherein the spatial filter is made of a reversible photosensitive material such that said spatial filter is created every time an information carrier is inserted into said device.

25 8 A method of manufacturing a cryptographic key comprising the steps of:

- holographic exposing a layer of photopolymer for creating a diffractive structure,
- flood exposing said photopolymer layer to polymerise said diffractive structure,
- illuminating a first photosensitive material with a light source through the diffractive structure for forming a spatial filter having a predetermined pattern, an activation of said
- 30 photosensitive material being performed when an intensity of a speckle pattern delivered by the diffractive structure for a given wave front of the light source is higher than a predetermined threshold.

9 A method as claimed in Claim 8, further comprising the step of illuminating a second photosensitive material with a light source for locally activate or deactivate said material in order to form a detector array.

AMENDED CLAIMS

[received by the International Bureau on 30 August 2004 (30.08.2004);
original claims 1-9 replaced by new claims 1-10 (2 pages)]

- 1 An information carrier comprising:
 - a diffractive layer made of photopolymers, for delivering a speckle pattern when illuminated by a light source,
 - a spatial filtering layer including a binary mask made of a photosensitive material, for delivering a filtered optical signal from the speckle pattern, said spatial filtering layer being aligned with respect to the diffractive layer, and
 - a detection layer for transforming said filtered optical signal into an electrical signal,
- 10 from which a cryptographic key is generated.

- 2 An information carrier as claimed in claim 1, wherein the detection layer is made of a patterned photoelectric material.

- 15 3 An information carrier as claimed in claim 1, further comprising a spacer for separating the diffractive layer from the spatial filtering layer, said spacer having a width which is larger than the wavelength of the light source and smaller than the width of the diffractive layer.

- 20 4 A device for reading an information carrier as claimed in claim 1, said device comprising:
 - means for computing a cryptographic key from the electrical signal delivered by the detection layer, and
 - means for decrypting encrypted data contained in the information carrier based on the cryptographic key.
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- 5 An information carrier comprising:
 - a diffractive layer made of photopolymers, for delivering a speckle pattern when illuminated by a light source, and
 - a spatial filtering layer including a binary mask made of a photosensitive material, for delivering a filtered optical signal from the speckle pattern, said spatial filtering layer being aligned with respect to the diffractive layer.
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6 An information carrier as claimed in claim 5, further comprising a spacer for separating the diffractive layer from the spatial filtering layer, said spacer having a width which is larger than the wavelength of the light source and smaller than the width of the diffractive layer.

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7 A device for reading an information carrier as claimed in claim 5, said device comprising:

- a detector array for transforming the filtered optical signal into an electrical signal,
- means for computing a cryptographic key from said electrical signal, and
- 10 - means for decrypting encrypted data contained in the information carrier from the cryptographic key.

8 A device as claimed in claim 1, wherein the detector array is made of a patterned photoelectric material.

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9 A device for reading an information carrier comprising a diffractive layer for delivering a speckle pattern when illuminated by a light source, said device comprising:

- a spatial filter for delivering a filtered optical signal from the speckle pattern, said spatial filter including a binary mask made of a reversible photosensitive material such that 20 said binary mask is created every time an information carrier is inserted into said device,
- a detector array for transforming the filtered optical signal into an electrical signal,
- means for computing a cryptographic key from said electrical signal, and
- means for decrypting encrypted data contained in the information carrier from the cryptographic key.

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10 A method of manufacturing an information carrier as claimed in claim 1 or 5, said method comprising the steps of:

- holographic exposing a layer of photopolymer so as to create a diffractive structure,
- illuminating at the same time said photopolymer layer so as to polymerize said 30 diffractive structure, and a layer made of photosensitive material through the diffractive structure so as to form a spatial filter having a binary mask including activated and non-activated areas, an activation of said photosensitive material being performed when an intensity of a speckle pattern delivered by the diffractive structure for a given wave front of the light source is higher than a predetermined threshold.